

**48 - Methylarsenate distribution and speciation in soil**

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Monomethylarsenate (MMA) and dimethylarsenate (DMA) have been used as herbicides and pesticides for decades in the U. S. Biological processes can transform MMA or DMA into inorganic arsenate or arsenite. Arsenic's toxicity is related not only related to its total amount, but also to its chemical forms or speciation, which influences As's mobility, bioavailability, and interactions with other elements. A sandy loam soil was spiked with MMA and DMA and incubated for one year to investigate arsenic speciation changes over time. Synchrotron based micro-X-ray absorption spectroscopy, micro-X-ray fluorescence spectroscopy, and micro-X-ray diffraction techniques were employed to study As speciation, distribution and association with other elements, and mineral formation in the soil. The results show that arsenic was associated with iron and that sorbed MMA and DMA were demethylated to arsenate over time with the demethylation rate of DMA being faster than for MMA.

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